WHAT IS CLAIMED IS:

1. A system comprising:

a direct oxidation fuel cell, comprising a housing surrounding an MEA, a current collector disposed on the outside of the MEA to collect and conduct electrical current to a load, and a gas-permeable liquid-impermeable membrane disposed on a cathode-side outer surface of the current collector, wherein said MEA comprises an anode aspect, a cathode aspect, and a PCM disposed between the anode aspect and the cathode aspect;

a source of fuel in communication with the anode aspect;

a source of oxygen in communication with the cathode aspect, so as to produce electricity-generating reactions, comprising anodic disassociation of a fuel and water mixture to produce carbon dioxide, protons and electrons and a cathodic combination of protons, electrons and oxygen to produce water; and

a pump in fluid communication with an area between the PCM and the gas-permeable liquid-impermeable membrane, connected to remove excess water produced at the cathode aspect.

2. The system of claim 1, wherein said MEA comprises an anode diffusion layer, a cathode diffusion layer, and a PCM disposed between the anode and the cathode, said PCM having an anode catalyst layer in intimate contact with the anode diffusion layer and a cathode catalyst layer in intimate contact with the cathode diffusion layer.

3. The system of claim 1, wherein said pump is in fluid communication with the fuel source and connected to pump water produced at the cathode side to the fuel source to adjust the fuel concentration to the desired level.

4. The system of claim 1, wherein said pump is driven by the electricity generated by the fuel cell.

5. The system of claim 1, wherein said current collector comprises a wire mesh.

6. The system of claim 2, wherein said cathode catalyst layer comprises platinum.

7. The system of claim 2, wherein said anode catalyst layer comprises a platinum/ruthenium alloy or platinum.

8. The system of claim 1, wherein said MEA comprises at least one conduit in communication with said pump.

9. The system of claim 1, wherein said PCM comprises a perfluorocarbon sulfonic acid ionomer.

10. The system of claim 1, wherein said fuel is organic.

11. The system of claim 10, wherein said fuel is an aqueous solution of methanol.

12. The system of claim 11, wherein said fuel is a about a 50% aqueous solution of methanol.

13. The system of claim 1, wherein said pump is connected to said MEA by a conduit.

14. A method for managing water in a direct oxidation fuel cell, comprising:

providing a direct oxidation fuel cell, comprising: a housing surrounding an MEA, a current collector disposed on the outside of the MEA to collect and conduct electrical current to a load, and a gas-permeable liquid-impermeable membrane disposed on a cathode-side outer surface of the current collector, wherein said MEA comprises an anode aspect, a cathode aspect and a PCM disposed between the anode aspect and the cathode aspect;

providing fuel to the anode aspect of the fuel cell;

providing oxygen to the cathode aspect of the fuel cell; and

removing excess water accumulation from an area between the PCM and the gas-permeable liquid-impermeable membrane.

15. The method of claim 14, wherein said MEA comprises an anode diffusion layer, a cathode diffusion layer, and a PCM disposed between the anode and the cathode, said PCM having an anode catalyst layer in intimate contact with the anode diffusion layer and a cathode catalyst layer in intimate contact with the cathode diffusion layer.

16. The method of claim 14, wherein said excess water is removed by a pressure differential created in the area between the PCM and the gas-permeable liquid-impermeable membrane.

17. The method of claim 16, wherein said pressure differential is created by a pump.

18. The method of claim 17, wherein said pump is a piezoelectically driven pump, a mechanical pump, or an electro-osmotic pump.

19. The method of claim 14, further comprising recirculating at least a portion of the removed water to adjust the fuel concentration.

20. The method of claim 14, wherein said excess water is recirculated by a pump in fluid communication with the fuel source and the area between the PCM and the gas-permeable liquid-impermeable membrane to adjust the fuel concentration to a desired level.

21. The method of claim 14, wherein said gas-permeable liquid-impermeable membrane filters the oxygen provided to the cathode aspect.

22. The method of claim 17 or 20, wherein said pump is driven by the electricity generated by the fuel cell.

23. The method of claim 14, wherein said fuel is organic.

24. The method of claim 23, wherein said fuel is an aqueous solution of methanol.

25. A method of operating a direct oxidation fuel cell, comprising:

providing a direct oxidation fuel cell, comprising: a housing surrounding an MEA, a current collector disposed on the outside of the MEA to collect and conduct electrical current to a load, and a gas-permeable liquid-impermeable membrane disposed on a cathode-side outer surface of the current collector, wherein said MEA comprises an anode aspect, a cathode aspect and a PCM disposed between the anode aspect and the cathode aspect;

providing fuel to the anode aspect of the fuel cell;

providing oxygen to the cathode aspect of the fuel cell; and

drawing air to the surface of, into or through the cathode aspect of the MEA.

26. The method of claim 25, wherein said air is drawn through the MEA by a pressure differential created in the area between the PCM and the gas-permeable liquid-impermeable membrane.

27. The method of claim 26, wherein said pressure differential is created by a pump.

28. The method of claim 27, wherein said pump is a piezoelectically driven pump, a mechanical pump, or an electro-osmotic pump.

29. The method of claim 25, wherein said gas-permeable liquid-impermeable membrane filters the oxygen provided to the cathode.

30. The method of claim 27, wherein said pump is driven by the electricity generated by the fuel cell.

31. The method of claim 25, wherein said MEA comprises an anode diffusion layer, a cathode diffusion layer, and a PCM disposed between the anode and

the cathode, said PCM having an anode catalyst layer in intimate contact with the anode diffusion layer and a cathode catalyst layer in intimate contact with the cathode diffusion layer.